

RFID BASED ATTENDANCE MANAGEMENT SYSTEM USING LABVIEW

**NAME: BARID BARAN NAYAK
ROLL NO: 111EI0250**



Department of Electronics & Communication Engineering
National Institute of Technology, Rourkela
Rourkela-769008, Odisha, INDIA

RFID BASED ATTENDANCE MANAGEMENT SYSTEM USING LABVIEW

A PROJECT REPORT

***Submitted in partial fulfillment of the requirements for the award of the
Degree of***

Bachelor of Technology

In

Electronics and Instrumentation Engineering

By

Barid Baran Nayak

Roll No: 111EI0250

**Under the guidance of
UPENDRA KUMAR SAHOO**



Department of Electronics and Communication Engineering
National Institute of Technology
Rourkela, 769008, Odisha, INDIA

National Institute of Technology, Rourkela



DECLARATION

I declare that the project work with the title “**RFID BASED ATTENDANCE MANAGEMENT SYSTEM USING LABVIEW**” is my original work done under Prof. UPENDRA KUMAR SAHOO, National Institute of Technology, Rourkela. I have learned and followed all the rules and regulations provided by the Institute while writing this thesis. I have confirmed to the various guidelines present in the Ethical Code of Conduct of the Institute. In my entire project wherever help of others were involved, every endeavor had been made to acknowledge this clearly with due reference to literature. This project work is being submitted in the fulfilment of the requirements for the degree of Bachelor of Technology in Electronics and Instrumentation Engineering at National Institute of Technology, Rourkela for the academic session 2011– 2015.



CERTIFICATE

This is to certify that the proposition entitled, "**RFID BASED ATTENDANCE MANGEMENT SYSTEM USING LABVIEW**" put together by **Sri BARID BARAN NAYAK** in partial fulfillment of the prerequisites for the grant of Bachelor of Technology Degree in Electronics and Instrumentation Engineering at the National Institute of Technology, Rourkela is a bona fide work completed by him under my watch and direction.

To the best of my insight, the matter encapsulated in the postulation has not been submitted to any other college/ establishment for the honor of any Degree or Diploma.

Date:

Prof. UPENDRA KUMAR SAHOO
Department of Electronics & Instrumentation Engg.
National Institute of Technology
Rourkela – 769008

ACKNOWLEDGEMENTS

On the submission of this Thesis report of “**RFID BASED ATTENDANCE MANAGEMENT SYSTEM USING LABVIEW**”, I would like to express my thanks to my supervisor **Prof. UPENDRA KUMAR SAHOO** for his help and guidance throughout the entire project. I would like to thank him for his encouragement, and support throughout the course of this work from the core of my heart. It was an invaluable learning experience for me to be one of his students. As my supervisor his insight, observations and suggestions helped me to establish the overall direction of the research and contributed immensely for the success of this work. His immense knowledge, technical skills and human values have been a source of my inspiration.

My thanks are extended to my parents who helped me with the moral support throughout my project. I would also like to thank them for providing me with all the necessary equipments required to complete this project.

Finally I would like to thank my friends, who built an academic and friendly research environment that made my study at NIT, Rourkela most fruitful.

BARID BARAN NAYAK
111EI0250

ABSTRACT

Recently, number of application of RFID technology has increased. Today RFID is applied to agriculture, retail industry, manufacturing industry, keeping track of vehicle etc. RFID works wirelessly. It automatically identifies using wireless technology. In my project, I have tried to solve the problem of rigorous and monotonic attendance procedure followed today. Manually attendance is taken of every student or employee. But in this method lot of time is wasted. Moreover it is erroneous. So this electronics based product will not only make the attendance procedure flexible, but also will keep the records error free. In my design the students will be provided with the low cost passive tags. This tags will be used in the identifying the student. Once the tag is detected by the reader the data is sent to the ARM processor for further processing. Processor displays the received data on LCD and then sends it to the PC/Laptop for database management. The database management is done using LabVIEW. It is a low cost method for attendance management. Further the use of LabVIEW made the real time data acquisition fast.

Keywords: RFID, LabVIEW, ARM, Tags, Readers

CONTENTS

Declaration.....	3
Certificate.....	4
Acknowledgement.....	5
Abstract.....	6
Contents.....	7
List of Figures.....	9
Chapter 1 LITERATURE OVERVIEW.....	10
1.1 Introduction.....	11
1.2 Hardwire Requirements	12
1.3 RFID History	12
1.4 RFID System.....	13
1.5 RFID Reader.....	14
1.6 RFID tags.....	15
1.7 RFID Middleware.....	16
1.8 ARM-7 Processor (LPC2148).....	17
1.9 EM-18 Module.....	19
Chapter 2 DESIGN AND IMPLEMENTATION.....	21
2.1 Hardware and Software flow chart.....	22
2.2 Implementation.....	23
2.3Working.....	24
Chapter 3 SOFTWARE AND CODE USED.....	25
3.1 List of software used.....	26

3.2 Keil μ -vision IDE.....	26
3.3 Flash Magic.....	32
3.4 LabVIEW 2013.....	33
3.5 Complete code for ARM processor.....	35
3.6 Front panel diagrams and block diagrams (step by step).....	38
Chapter 4 RESULTS AND CONCLUSION.....	42
4.1 Complete interface diagram	43
4.2 Results obtained.....	43
4.3 Future Scope and Enhancements.....	44
4.4 Conclusion.....	44
Chapter 5 REFERENCES.....	45
5.1 References.....	46

LIST OF FIGURES

Figure 1: Position of RFID systems in the AIDC landscapes

Figure 2: Types of RFID readers

Figure 3: Sample of Tags

Figure 4: ARM-7 DEVELOPMENT BOARD

Figure 5: RFID reader used (125 KHz)

Figure 6: Bottom view of EM-18

Figure 7: Basal specification and various outputs of EM-18

Figure 8: Block diagram of general working of a RFID system.

Figure 9: Algorithm for the hardware interface

Figure 10: Algorithm for database management

Figure 11: Figure 11: keil interface (a) open keil μ -vision IDE (b) create a new project (c) link the target options and set the parameters (d) select load application at start up (e) add files to the group for further checking and simulation

Figure 12: flash magic

Figure 13: (a) front panel diagram (b) controls that can be implemented

Figure 14: (a) block diagram window (b) operation/functions that can be implemented

Figure 15: serial communication using LabVIEW

Figure 16: selecting data from database using LabVIEW

Figure 17: writing a new data to the database using LabVIEW

Figure 18: updating data to the database using LabVIEW

Figure 19: Complete block diagram of the process

Figure 20: Complete front panel diagram

Figure 21: complete interface diagram of hardware.

Figure 22: card detect > LCD display > serial Comm. To PC

Figure 23: Before and after updating the database

CHAPTER 1

LITERATURE OVERVIEW

INTRODUCTION

Manual attendance is a time consuming task. An electronics based approach is applied so as to reduce the time involved in recurrent manual attendance. RFID (radio frequency identification) technology is used for this purpose. This RFID reader used here is EM-18. The tags used here is passive tags. Because of the low amount of data required to be stored on the tag passive tag is used. The EM-18 module is used to detect the RFID tag that is present within the range. The EM-18 module works at 125 KHz with a read range of 8-10 cm. The tag has its own circuitry which operates by deriving power from the reader. It has a 12 ASCII data that it transfers to the reader. Reader receives the data and then sends the data in two different ways. One is via RS232 and other is by weigand26 format. I have used the RS232 mode for data transfer. After the data is received then this data is displayed on the LCD screen. Simultaneously the data is sent to the PC via serial communication. After the data is received it arranged in the database in Microsoft access 2010. LabVIEW is used for receiving the real time data from the processor and send it to Microsoft access. All the process will be taking place in real time only. Maintaining the data integrity was difficult but it was handled with care.

HARDWARE REQUIREMENTS

1. ARM-7 Processor (LPC2148)
2. EM-18 Module (RFID Reader)
3. Passive tags
4. RS232 Cable
5. Power source cable
6. Bread board
7. One-one female pin connector

RFID HISTORY

The RFID idea is not new but rather has been around for a considerable length of time; actually, it was first seen in WWII by the Air-Force to distinguish between friend flying planes to that of opponent airplane utilizing radars (table 1 below shows brief of the historical backdrop of RFID innovation). From that point forward, this invention has been utilized for different corner applications, for example retail industry, keeping track of goods anti-theft frameworks, gear following in air terminals, electronic tolls, and many others. This was the starting period of RFID technology era.

Table 1: HISTORY OF RFID SYSTEMS

1930 to 1940	IFF system was created by a research laboratory.
1940 to 1950	It was then used to identify friend or enemy in WWII Modern air traffic also used the identify friend or enemy concepts.
1950 to 1960	Gradually RFID concepts were applied to military sectors. It was used in research laboratories.

1960 to 1970	SENSOR systems that used RFID technology began in this period of time.
1970 to 1980	Passive tags were introduced for the 1 st time in this period. RFID was now used in zoos and national parks to keep track of animals
1980 to 1990	RFID systems were now manufactured in a large scale. Automatic payment at toll gates application began in this period.
1990 to 2000	Inter-operable equipment with RFID technology was developed.
2003	EPC global was now MIT's auto-identification center..
2005	EPC was launched by Walmart.

RFID SYSTEM

RFID is a technology which wirelessly identifies the chip or tag of interest and captures the data. It is otherwise known as AIDC. AIDC consists of card technology, barcodes used on products technology, biometric systems optical photo recognition systems etc. (see figure 1). RFID perfectly identifies the tags or the products attached with it provided they are present within the range. As a result it finds lot of applications in manufacturing or retail industries Any RFID system comprises of three components: (i) RFID tags, (ii) RFID reader (iii) RFID middleware application that is integrated into a host system. RFID Tags contain the information unique to each product/person (depending on application). This information is transferred to reader wirelessly and further processing is done.

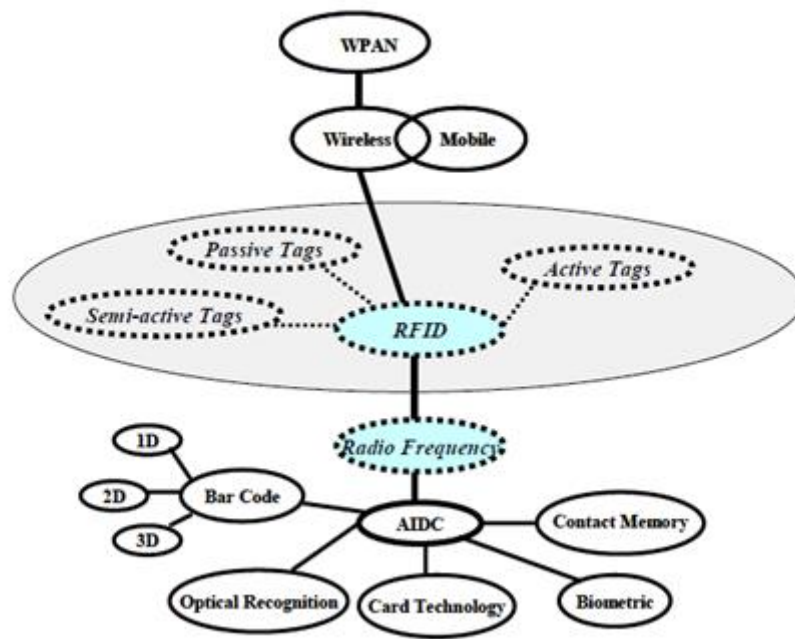


Figure 1: Position of RFID technology in the AIDC landscape

RFID READER

RFID readers are devices which emits radio signals through antennae. They also provide the necessary amount of power to the tags, if passive tags are used. RFID readers get the collect the data stream provided by the tags. Antennae present in the reader collects the information. Middleware handles the data flow between the tags and the reader. Large number of tags can be detected simultaneously without any problem. As shown in figure 2, RFID readers are of many types. Generally they are characterized based on the shape and size. They can be broadly put in three categories, one is fixed readers, second is hand-held readers and the third is mobile readers. Fixed readers are fixed to the walls or doors or mat lifts, mobile readers are used in handy items such as forklift small retail items or small items which are to be tracked.



Figure 2: various RFID readers' categories

RFID TAGS

RFID tags contain a wire circuit and antenna for data transmission. The antenna receives the required amount of power from the RFID reader. It also responds to the interrogation signal provided by the reader. RFID tags can be as small as a pin or can be as large as an identity card. They store information such as unique ID or mfd. Date, expiry date etc. RFID reader has various designs based on the operating carrier frequency, amount of information it is holding, memory it will be holding. RFID tags can be read/write type or can active/passive type. Passive tags do not have power source of its own. They take power from the reader, whereas active tags have a small battery from which they draw their power, and therefore have larger communication ranges, higher data transfer speed, more amount of data storage is possible, and high price tag. Figure 3 below shows different types of RFID tags.



Figure 3: various types of tags

RFID MIDDLEWARE

The RFID middleware is very important part of any RFID system. It collects all the data that tags give, does the filtering task and then send the data by Weigand or RS232 format. Then it routes the data to the dedicated information system. RFID middleware actually is used to control and manage the RFID readers' infrastructures. It is considered as the brain of any RFID system as it provides the most important functionalities. Some of its key functionalities are efficient management of data created by the RFID system.

Through there is a specific flowchart/algorithm for implementing the RFID systems, yet suitable tags, reader, antennas and middleware are selected based on the requirement. For example passive tags are used for high volume and low cost retail items; semi-dynamic labels are used for tracking medium cost items; at long last, dynamic tags are used for the costly items such as automobiles.

There are some problems in terms of low standards and large cost of hardware necessary to deploy RFID (e.g. tags, middleware). Apart there are a lot of problems based on the privacy and security. There are also many problems specific to different industries. Lastly there are also some technical problems such as inter-organizational information system and simultaneously management of large amount of data.

To curve standardization problems, widely accepted EPC network is used.

ARM-7 PROCESSOR (LPC2148)

Board Features

- LPC2148 is a powerful ARM based processor that fall into the category of ARM7TDMI. It has 512 Kb if memory.
- In this board no external power source is used. It draws power through the USB. It is very good for developing embedded applications.it is very good for real time monitoring, control and interactive control panel.
- Its interface can be of very high speed as high as 12Mb/s. Because of the UART there is no need for an additional programmer. There some other interface possible like SD card interface, USB 2.0 LCD etc.
- There are pin headers which are connected through the one to one connector. These pins are capable of performing 4 functions at a time. PINSEL register is present to handle these pin headers as general purpose or other specific funtions.



Figure 4: ARM-7 DEVELOPMENT BOARD

Specifications:

- it has 512 Kb of memory on the chip
- Crystal oscillator 12 Mhz
- RTC 32.768 KHz
- 50 pins are present for external interfacing.
- wireless adapter for Zigbee, Bluetooth interface
- 512 bytes of EEPROM
- USB connector
- slot for SD card
- connector for JTAG , 10 pins

- expansion header of 50 pins
- 16*2 Alphanumeric LCD
- L293D DC motor driver operating at 600 mA.
- ULN2003 driver to operate at 500 mA
- Dual RS232 UARTs for external communication
- Real-Time Clock with Battery Holder
- 2 Analog Potentiometers connected to ADC
- IR receiver for TSOP1738
- 4 push button type user switches
- 4 LEDs
- two switches for loading the program and resetting. Reset and BOOT switches solve the purpose
- button cell of 3V
- there is a ON/OFF switch to allow the power to the microcontroller.
- buzzer

LPC2148 Features:

- 16-bit/32-bit architecture is supported on this board.
- RAM is 40 Kb and flash memory is 512 Kb.
- Programming can be done by ISP or IAP type.
- Real time monitoring is possible with this board.
- USB 2.0 is present, it can operate in the full speed.
- 2 ADC's are present and 14 analog inputs in total for this purpose
- Analog output is done with the help of DAC. 10-bit DAC is present in this board.
- there are 2 timers that are present which is 32bit TIMER. There is a PWM unit and watchdog.
- real time clock present works with 32 KHz. It derives very less power.
- there are other UART for serial interface.
- there is interrupt controller. It uses vector address to handle the interrupt.
- PLL present is programmable 60 MHz clock is available for the same.
- it has very advanced power saving modes.
- There is peripheral clock different from system clock which enables the processor to operate at different clock rate.
- CPU

EM-18 MODULE (READER)

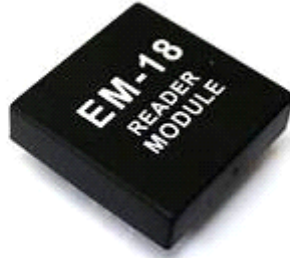


Figure 5: RFID reader used(125KHz)

Parameter:

- Operation voltage: 5V DC
- Current of operation is less than 50mA
- Frequency of operation: 125 KHz
- Distance of operation: 10cm

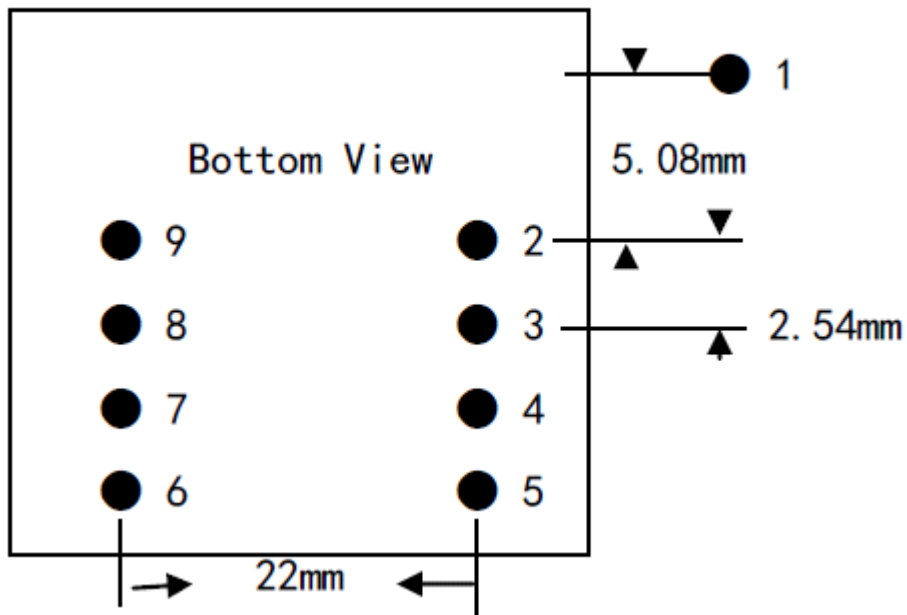


Figure 6: Bottom view of EM-18

BASAL SPECIFICATION

1	VCC	5V
2	GND	GND
3	BEEP	BEEP AND LED
4	ANT	NO USE
5	ANT	NO USE
6	SEL	HIGH IS RS232, LOW IS WEIGAND
7	RS232	RS232
8	D1	WEIGAND DATA 1
9	D0	WEIGAND DATA 0

Output format:

1. Wiegand26 (format)

Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Note	P	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	P
	P	E	E	E	E	E	E	E	E	E	E	E	E													P

Note: E: Summed for even parity 0: Summed for odd parity P: parity(even or odd) D: Data code for card:the data will use the last 24 data bits of card

2. RS232 interface format:

10 ASCII DATA (card no.) + 2 ASCII DATA (XOR result)

1. data baud rate: 9600BPS 2. data bit: 8bits 3. Parity check: none 4. stop bit: 1

Description:

32mm (length) * 32mm (width) * 8mm (height)

applied circle:

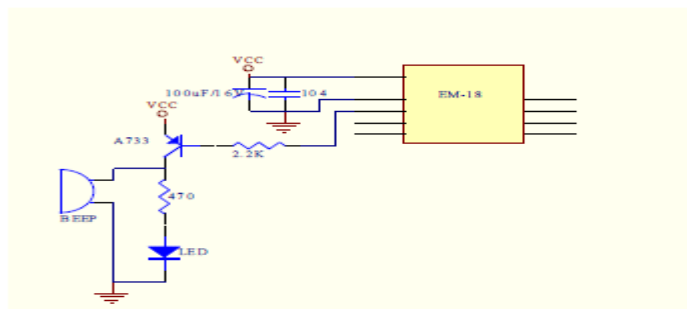


Figure 7: Basal specification and various outputs of EM-18

CHAPTER 2

DESIGN AND IMPLEMENTATION

HARDWARE AND SOFTWARE FLOW CHART

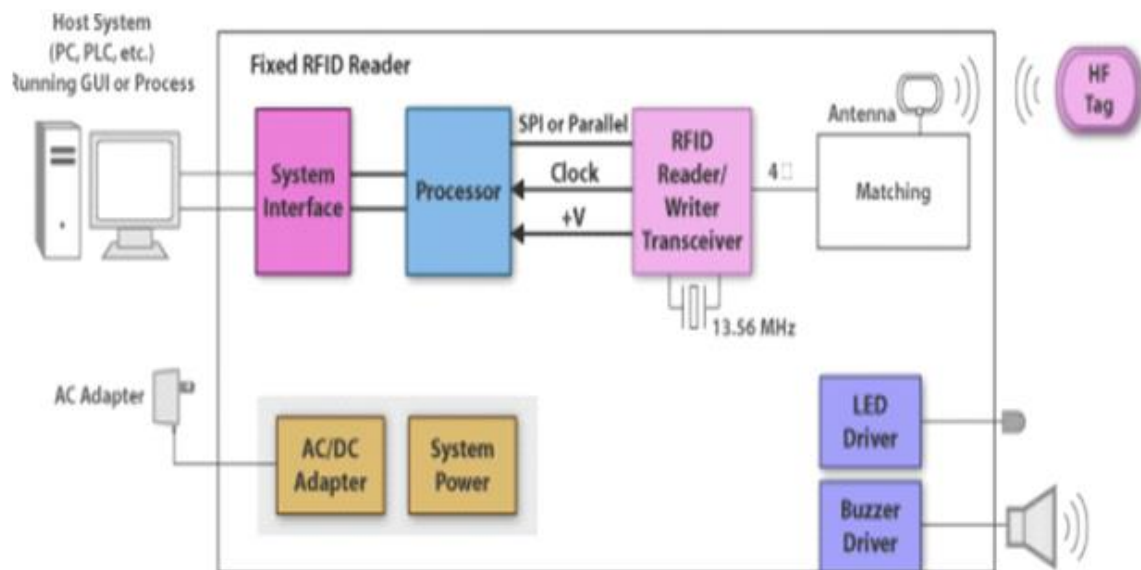


Figure 8: Block diagram of general working of a RFID system.

(Source: www.ti.com)

This is a general RFID system. In a normal RFID system a high/low frequency card is brought near the reader. On doing so unique card number in the tag is received at the reader. This then sent to the processor serially or by the Weigand format. After being received the data is sent to the pc or PLC where there will be a database and GUI.

FLOW CHART OF MY RFID SYSTEM

TAGS > RFID READER > PROCESSOR >
LCD > SERIAL COMM. >
PC>LABVIEW>MICROSOFT ACCESS
DATABASE

IMPLEMENTATION

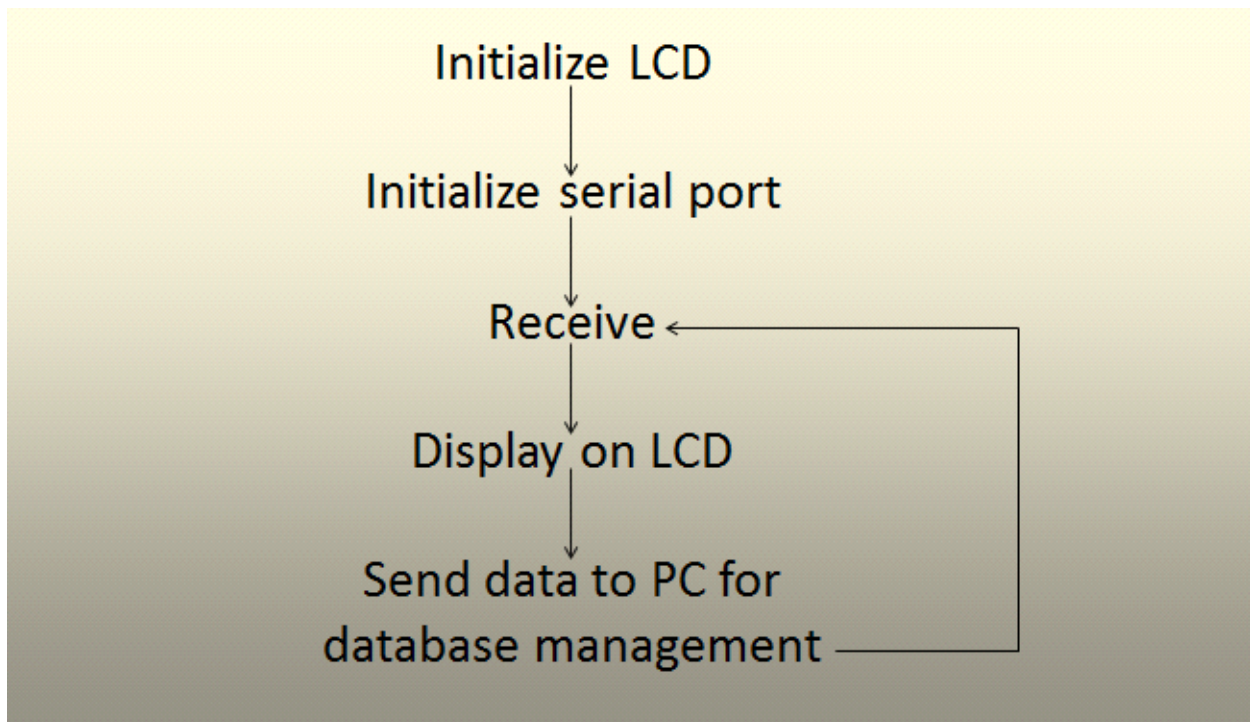


Figure 9: Algorithm for the hardware interface

The above figure shows the algorithm for the hardware interface. At first the LCD and the Serial port are initialized. Then the processor waits for the Reader data to arrive serially. Once the Reader data is present in ASCII format in the buffer of the processor, the processor forwards the data to the LCD. LCD displays the data and then sends the data to the PC where there is the GUI and Database management done.

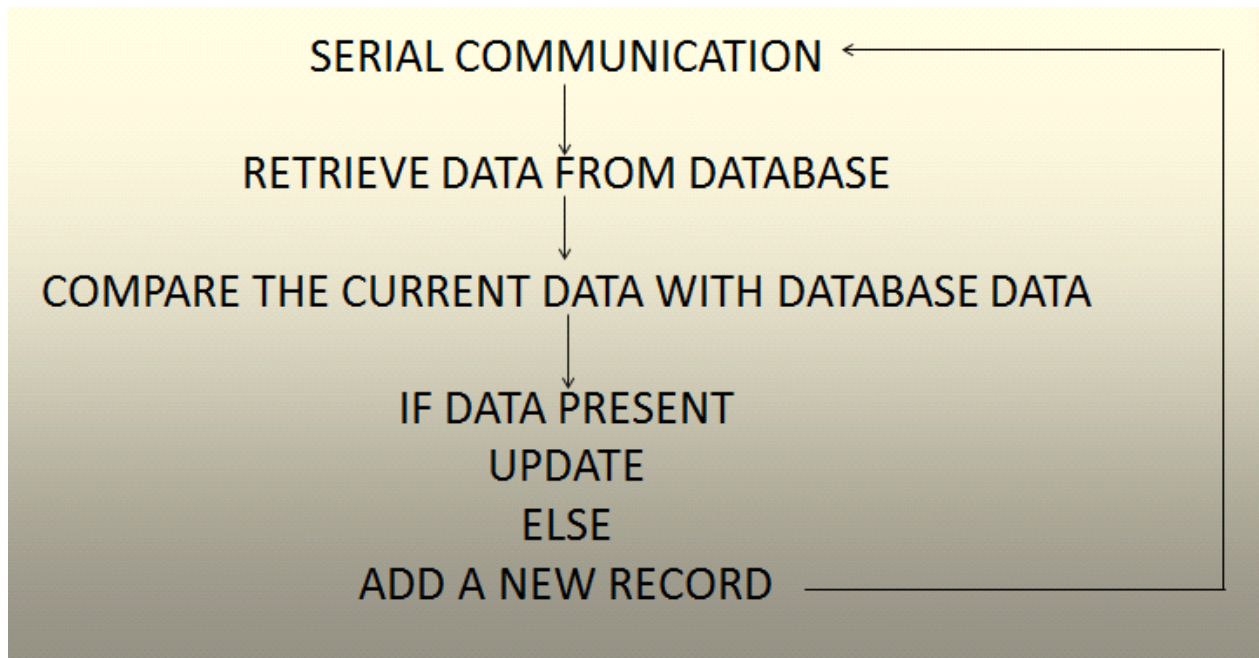


Figure 10: Algorithm for database management

Data sent by the processor is received by the serial module of LabVIEW2013. After receiving the data serially, LabVIEW access the already present data in the database and converts them into LabVIEW compatible formats. Then check if the data received at the USB terminal matches with any of the present data. If the match is successful then the database is updated to the new value. If unsuccessful then LabVIEW simply does not change the database.

WORKING

The working is simple. The identity card is brought near to reader within 8-10 cm. on doing so the 12 byte ASCII data is received by the reader. This received data is sent to the LCD for display. Simultaneously the data is sent to PC through serial communication. At the PC LabVIEW receives the data and then sends them to the database in following manner; if data already present then the data is updated or else no change in the database.

CHAPTER 3

SOFTWARE AND CODE USED

LIST OF SOFTWARE USED

1. Keil μ -vision IDE 4
2. Flash magic
3. LabVIEW 2013
4. Terminal software

KEIL μ -VISION IDE 3

KEIL μ -Vision IDE is, simplest way to create embedded systems.

General Remarks and Concepts

In the IDE the program or the code is written. This code is then simulated and finally converted to the HEX file so that it can be uploaded to the microcontroller kit. It is compatible with various different processors. The processor for which the HEX file is to generated is selected at the start.

Procedure to use keil

- Select the controller.
- Write the code in .C.
- Add the .C file to the group.
- In the options window tick on the “generate HEX file”.
- Check for the syntax and load it for compilation.
- If no error is found a hex file is generated which is used for burning on the controller.

Exercise 1: Using the Keil Toolset

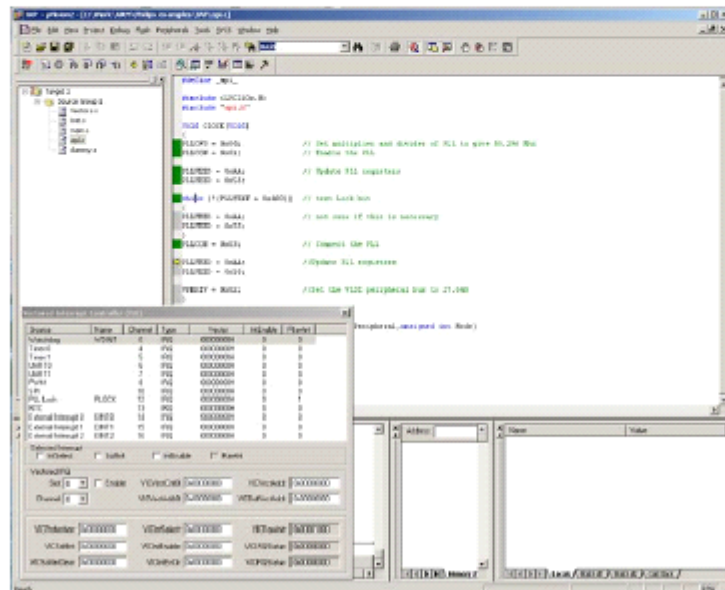
This example is based on the source code that can be found in

C:\Work\EX1 first program

In this first exercise we will spend some time defining a first project, building the code and downloading it into the simulator for debugging. We will then cover the basic debugging functions of the Keil simulator.

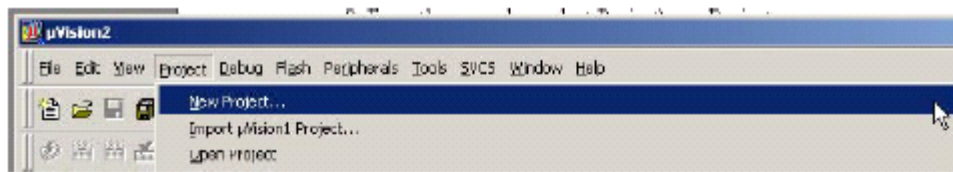


Double click on the Keil Uvision3 icon to start the IDE.

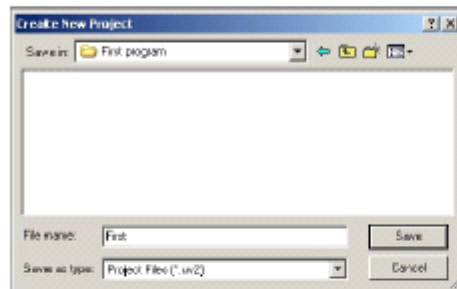


(a)

From the menu bar select Project/new Project.

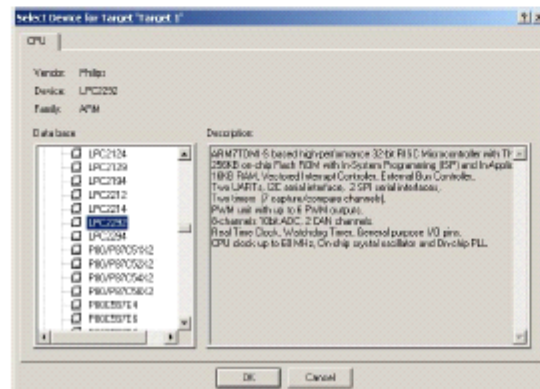


In the New project dialog navigate to your desired project directory.



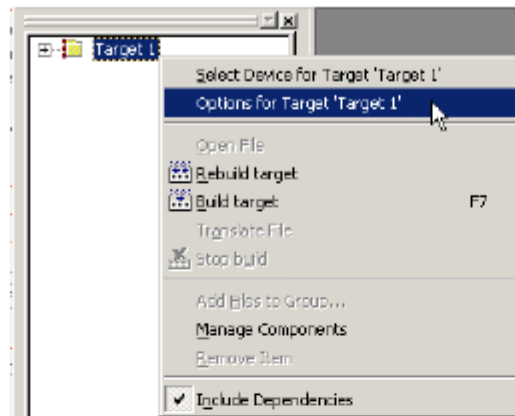
In the new project dialog name the project “first.uv2” and select Save.

A ‘select new device for target’ dialog will appear. Navigate through the device database and select the Philips\LPC2129 folder and then OK.

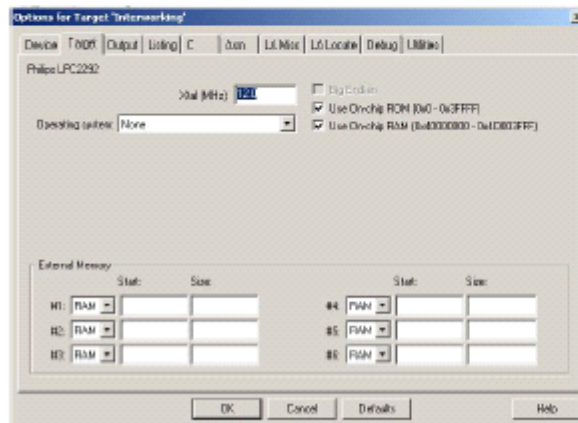


(b)

In the project browser highlight the 'Target1' root folder and select the local menu by pressing the right mouse button. In this menu select 'options for target'.

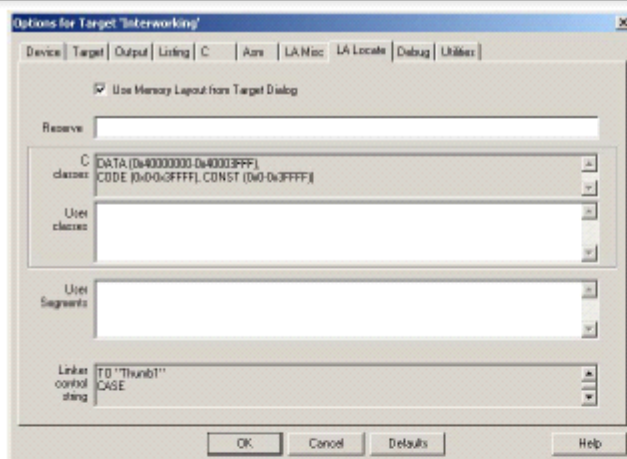


In the 'Target' tab, set the simulation frequency to 12.000 MHz. Also make sure the "Use on chip Rom" and "Use On chip Ram" boxes are ticked.

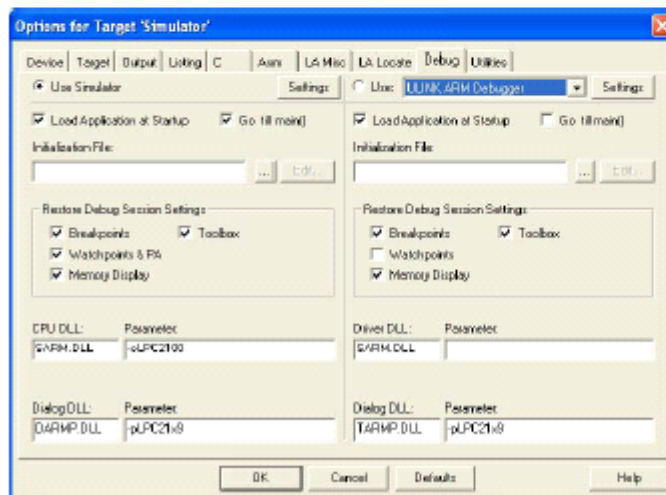


In the LA Locate tab, make sure that the "Use memory layout from target dialog" box is ticked.

(c)



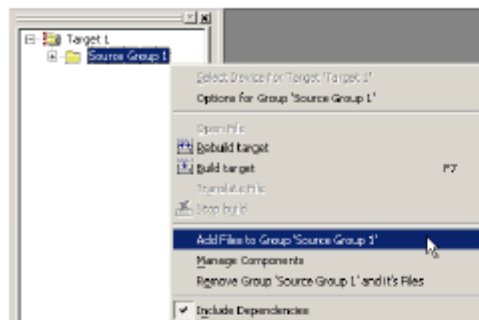
In the debug tab select make sure the use simulator radio button is checked along with the “Load application at startup” and “Go till main”.



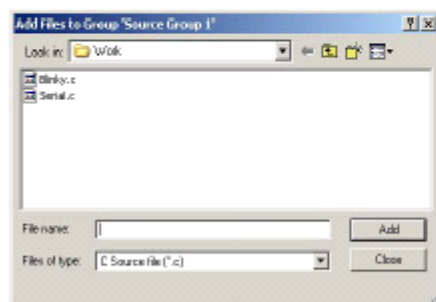
Select OK to complete the target options.

(d)

Highlight the 'source group 1' folder, open the local menu with a right click and select 'Add files to source group source group1'.



In the 'Add files to group' dialog add the file blinky.c and serial.c.



Change the 'Type of file' filter to ASM and add the file startup.s

These are all the source files necessary for the project so select "Close" .

Notes:

(i) You can view the source code contained in a file by double clicking on the file name in the project browser window.

(ii) The "manage components/project components" option also allows you to customise your project by adding extra source groups and different build options such as build for RAM debugging or Flash, debug in the simulator or with the JTAG.

Build the code by selecting the Project/build target menu or the F7 key. Build Icons are also available on the toolbar.

(e)

Figure 11: keil interface (a) open keil μ -vision IDE (b) create a new project (c) link the target options and set the parameters (d) select load application at start up (e) add files to the group for further checking and simulation

FLASH MAGIC

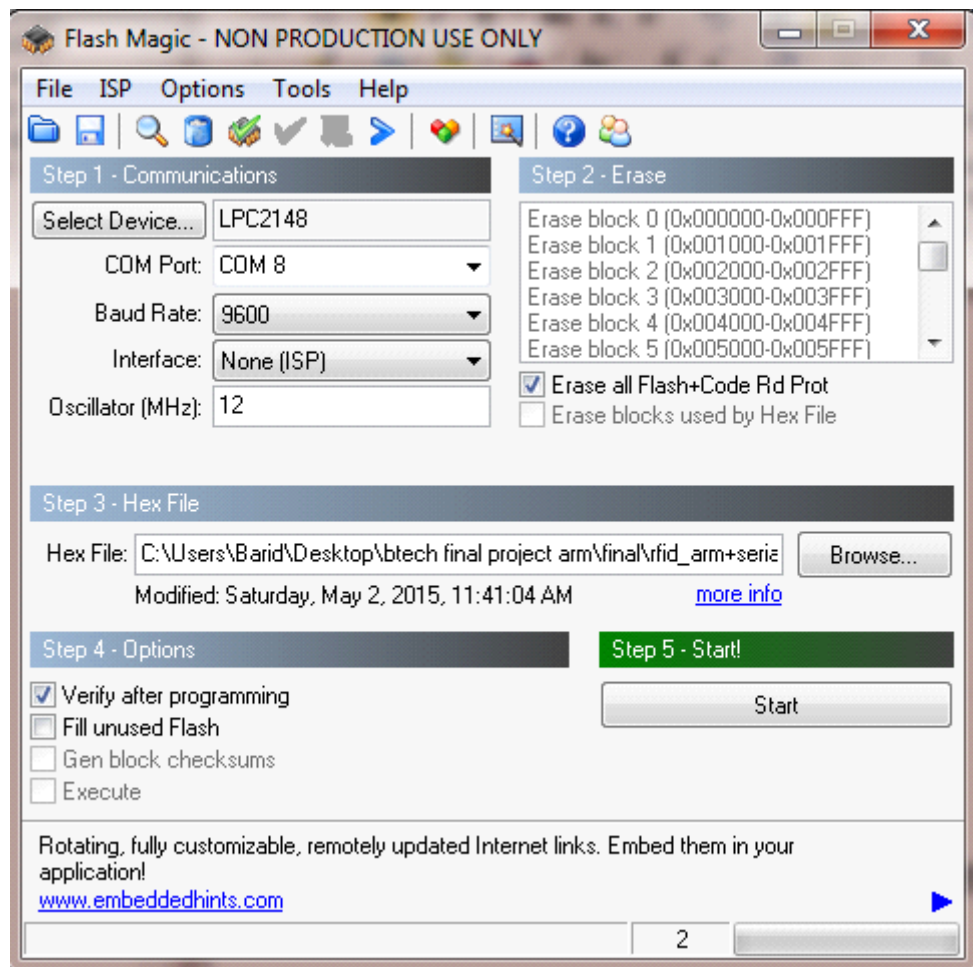
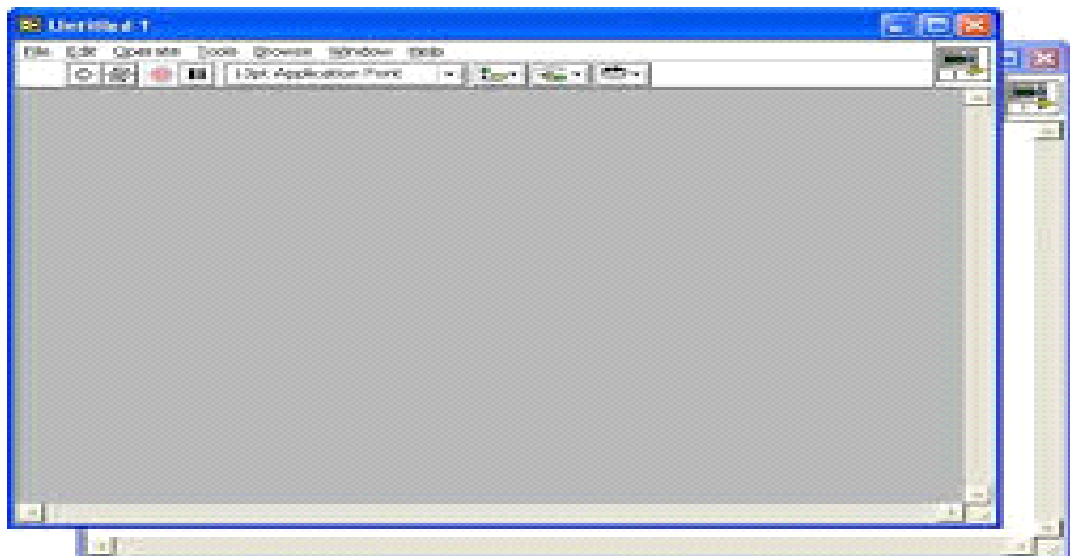


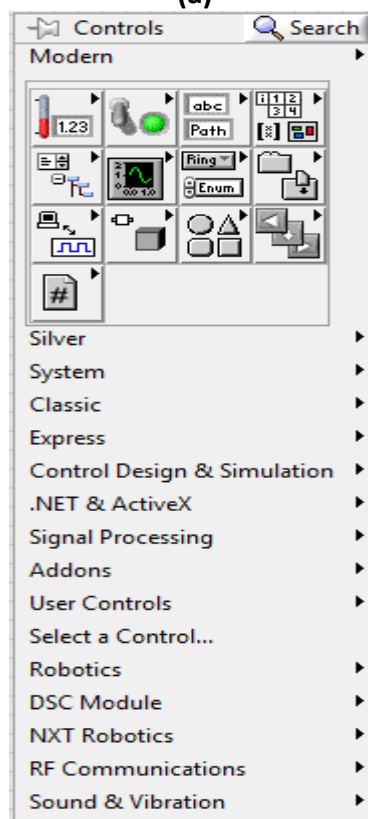
Figure 12: flash magic

This software is used to burn the hex file generated by the keil software onto the ARM processor. The com port to which write is to be done is selected. Baud rate is set to a value of 9600. Interface is kept as ISP. The oscillator frequency is kept to 12 MHz . The hex file is selected as shown. Verify and programming verifies if the hex file is in proper form and then uploads it to ARM after erasing the flash.

LABVIEW 2013



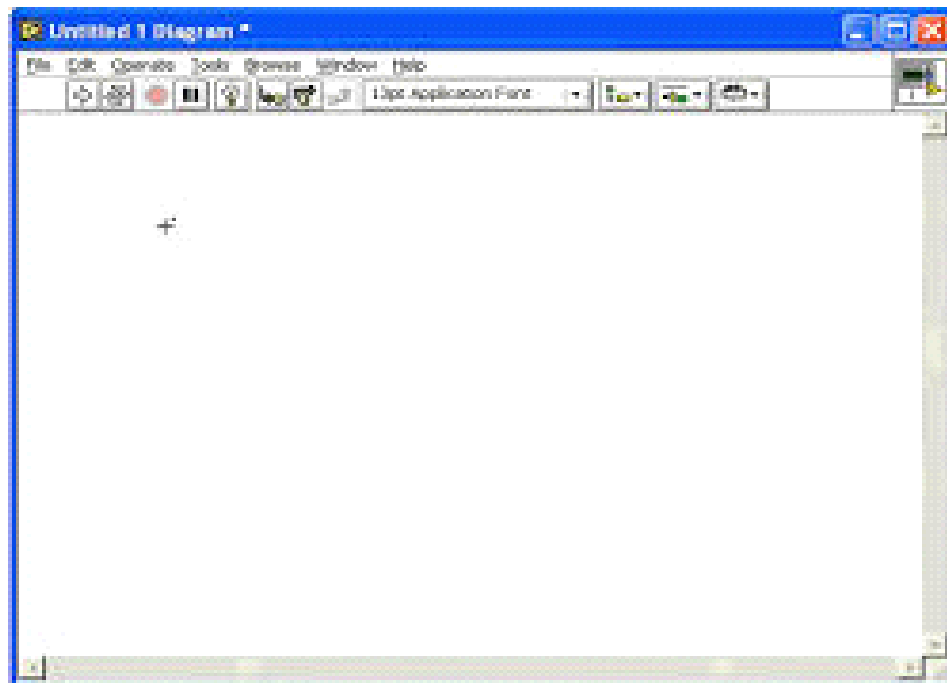
(a)



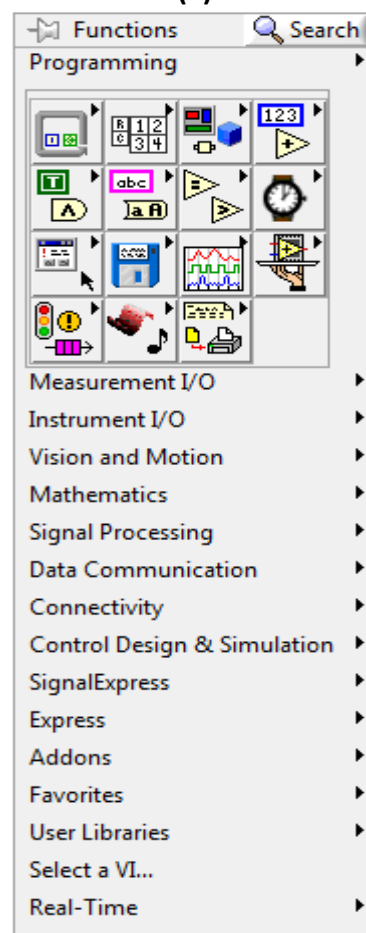
(b)

**Figure 13: (a) front panel diagram
(b) Controls that can be implemented**

Front panel show the GUI of all the inputs and outputs related. It is not concerned with the algorithm. It only provides control buttons and graphs/charts show all the required information.



(a)



(b)

**Figure 14: (a) block diagram window
(b) operations/functions that can be implemented**

This window implements the block diagram of the complete process. It takes the control variable from the front panel, modifies as per needed and then sends back the signal in the form of a chart , graph or indicator to the front panel. This is dataflow type programming. It is a high level graphical programming language.

COMPLETE CODE FOR ARM PROCESSOR

```
#include <LPC21xx.H>
unsigned char card_id[11];
unsigned char card_id2[11];//= {'1','2','3','4','5','6','7','8','9','0','1'};

void delay(unsigned long b){
    while (--b!=0);
}

void init_serial(void)
{
    PINSEL0    = 0x00050005;
    U0LCR      = 0x00000083;
    VPBDIV     = 0x2;
    U0DLL      = 0xc3;
    U0FCR      = 0x81;
    U0DLM      = 0x00;
    U0LCR      = 0x00000003;
    U1LCR      = 0x00000083;
    U1DLL      = 0xc3;
    U1LCR      = 0x00000003;
    U1FCR      = 0x81;
}

int receive(void)
{
    unsigned char k,j;
    while (!(U1LSR & 0x01) && (U1RBR != 0x81));

    for(k=0;k<=11;k++)
    {
        while (!(U1LSR & 0x01));
        card_id[k] =U1RBR;
        //U1LSR = U1LSR & 0x00;
    }
    for(j=0;j<=11;j++);
    {
        card_id2[k] = card_id [k+ 0x48];
    }
}
```

```

        return (0);
    }
    int send(void)
    {
        unsigned char s;
        for(s=0;s<=11;s++)
        {
            if (card_id[s] == '\n')
            {
                while (!(U0LSR & 0x20));
                U0THR = 0x0D; //if new line send cr
            }
            while (!(U0LSR & 0x20));
            U0THR = card_id[s]; //Otherwise send char
        }
        return (0);
    }
}

```

```

void write_command(int cmd) {
    IO1CLR |= 0x00f00000;
    IO1CLR |= 0x00040000;
    IO1CLR |= 0X00020000;
    IO1SET |= 0x00f00000 & cmd;
    IO1SET |= 0X00080000;
    delay(30000);
    IO1CLR |= 0x00080000;
}

```

```

void write_data(int dat) {
    IO1CLR |= 0x00f00000;
    IO1CLR |= 0x00040000;

    IO1SET |= 0X00020000;
    IO1SET |= 0x00f00000 & dat;
    IO1SET |= 0X00080000;

    delay(30000);
    IO1CLR |= 0x00080000;

}

```

```

void lcd_data(char dat){
    write_data(dat << 16);
    write_data(dat << 20);
}

```

```

void lcd_command(char cmd){
    write_command(cmd << 16);
}

```

```

    write_command(cmd << 20);
}

void printlcd(unsigned char *CPtr){
    while(*CPtr != '\0') {
        lcd_data(*CPtr);
        CPtr++;
        delay(20000);
    }
}

void init_lcd(void)
{
    IO1DIR |= 0x00FE0000;
    delay(200000) ;
    write_command(0x30 << 16);
    delay(100000);
    write_command(0x30 << 16);
    delay(100000);
    write_command(0x30 << 16);
    delay(100000);
    write_command(0x20 << 16);

    lcd_command(0x01);
    lcd_command(0x06);
    lcd_command(0x0c);
    lcd_command(0x80);
}

int main(void)
{
    unsigned int i,k=0;
    init_lcd();
    init_serial();
    printlcd("show card");
    while(1)
    {
        receive();
        send();
        for(i=0;i<=11;i++)
        {
            lcd_command(0x80);
            printlcd(card_id);
        }

        for(k=0;k<11;k++)

```

```

    {
        card_id[k]= '\0';
    }
    /*for(k=0;k<11;k++)
    {
        card_id[k]= card_id2[k];
    }*/
    /*for(k=0;k<11;k++)
    {
        lcd_command(0x80);
        printflcd(card_id2);
    }*/
}
}

```

FRONT PANEL DIAGRAM AND BLOCK DIAGRAM (STEP BY STEP)

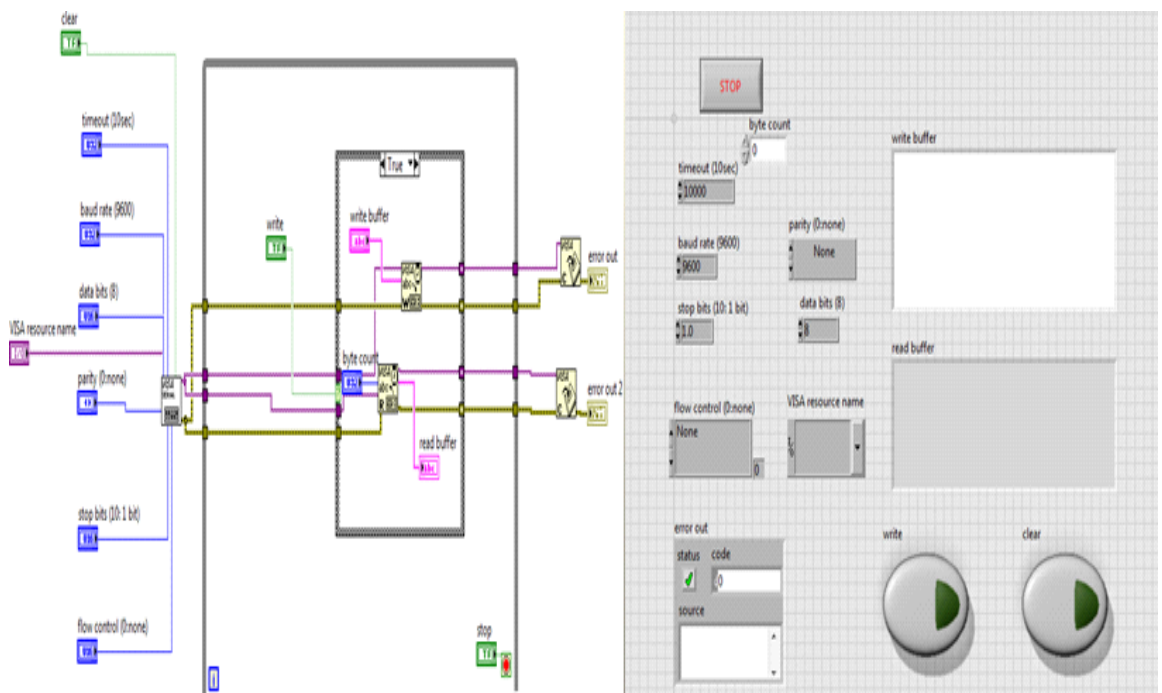


Figure 15: serial communication using LabVIEW

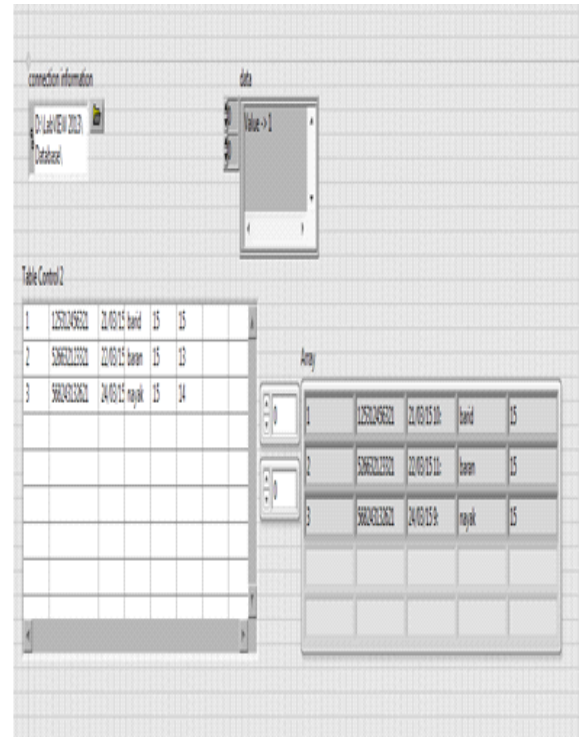
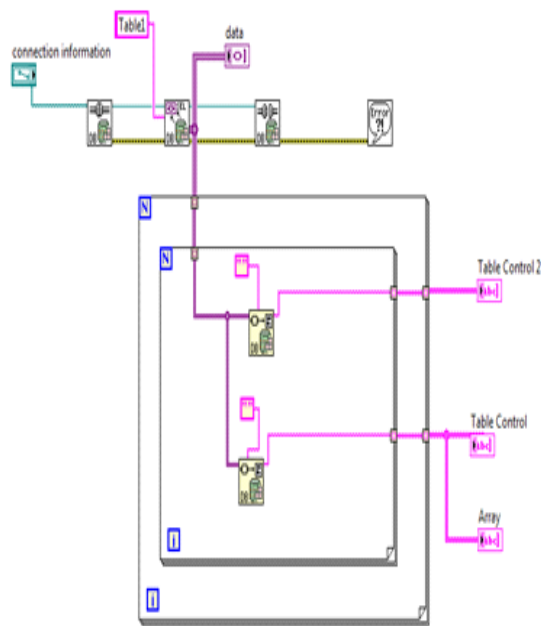


Figure 16: selecting data from database using LabVIEW

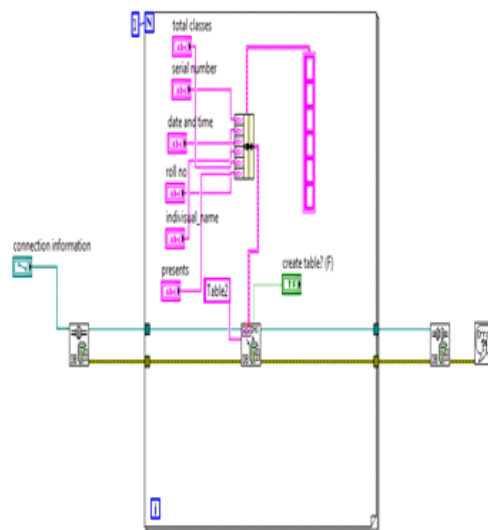


Figure 17: writing a new data to the database using LabVIEW

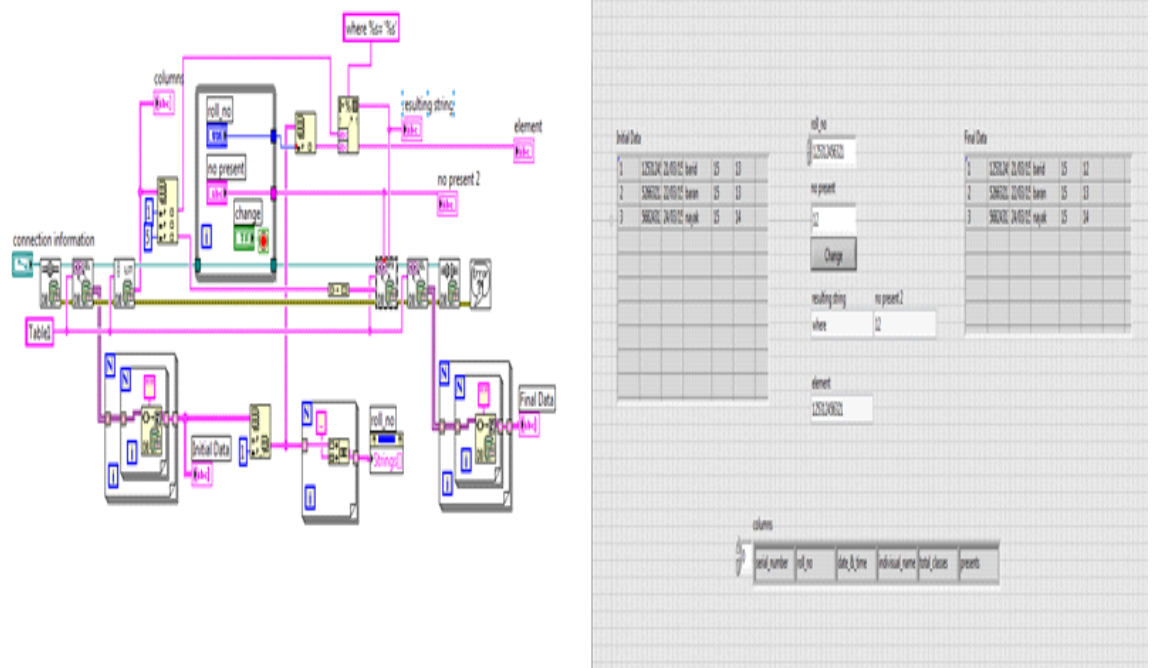


Figure 18: updating data to the database using LabVIEW

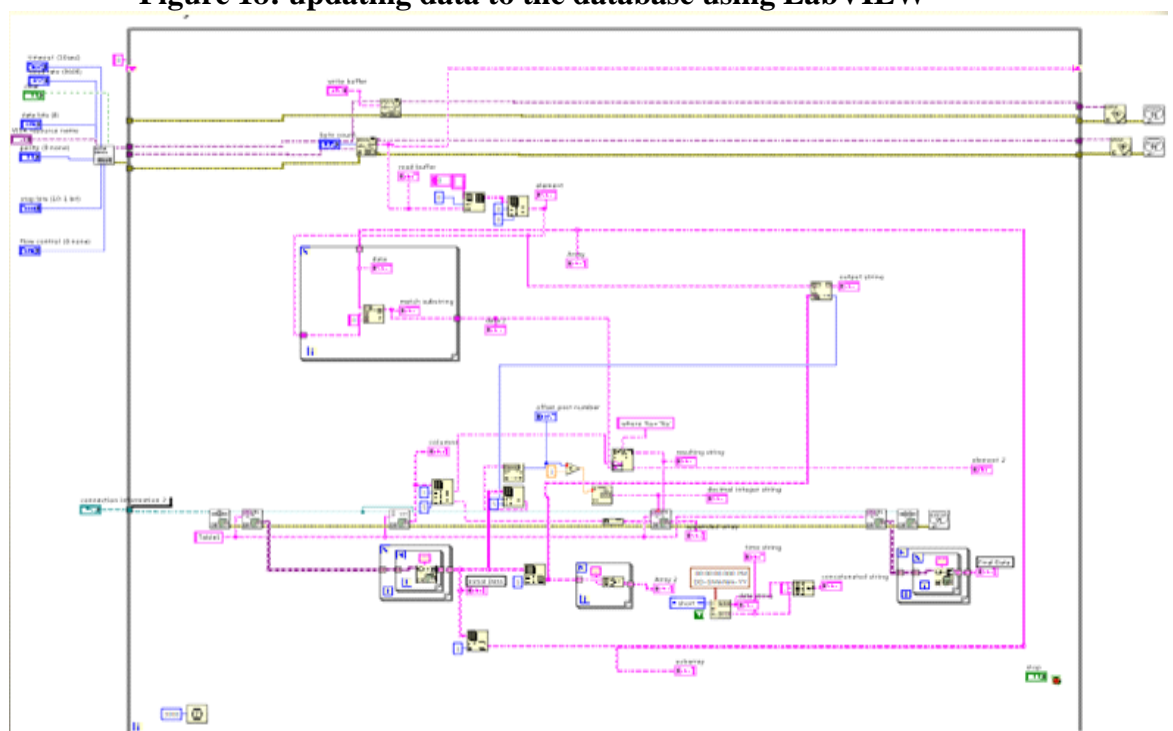


Figure 19: Complete block diagram of the process

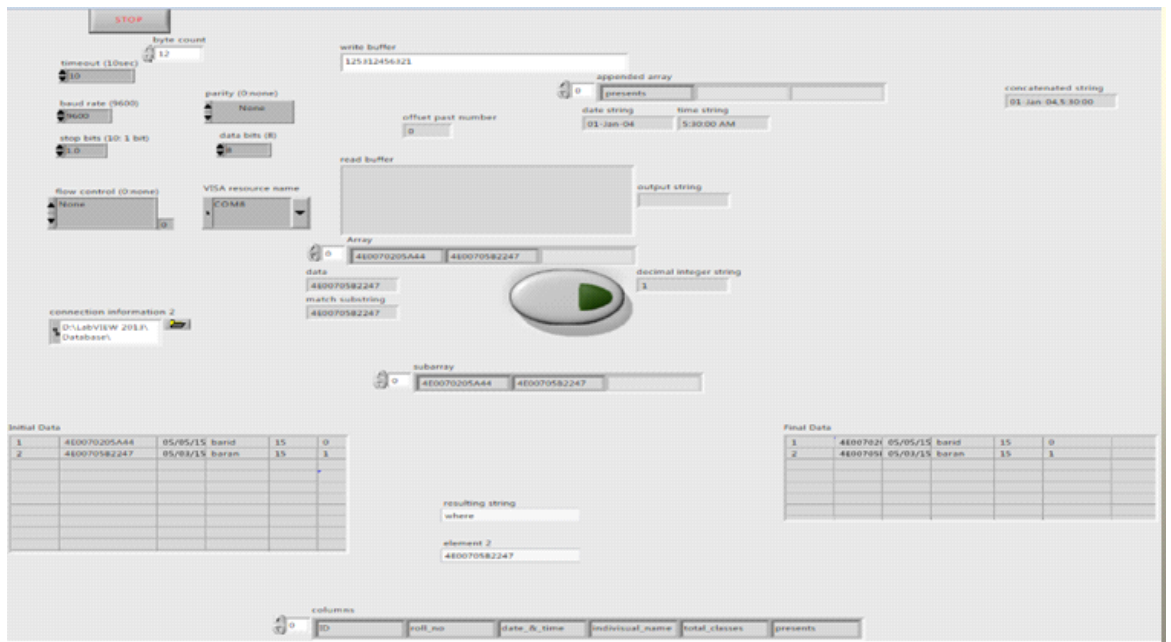


Figure 20: Complete front panel diagram

Chapter 4

Results and conclusion

Complete interface diagram

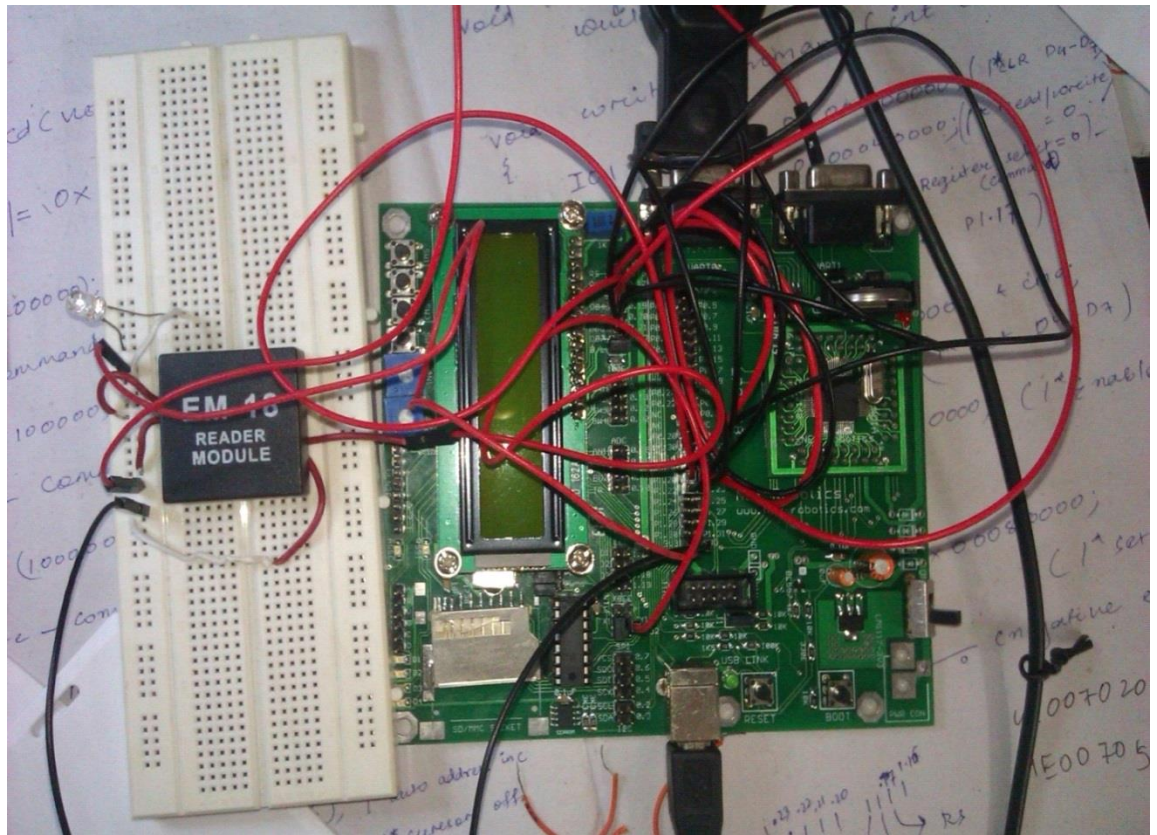


Figure 21: complete interface diagram of hardware.

RESULTS OBTAINED

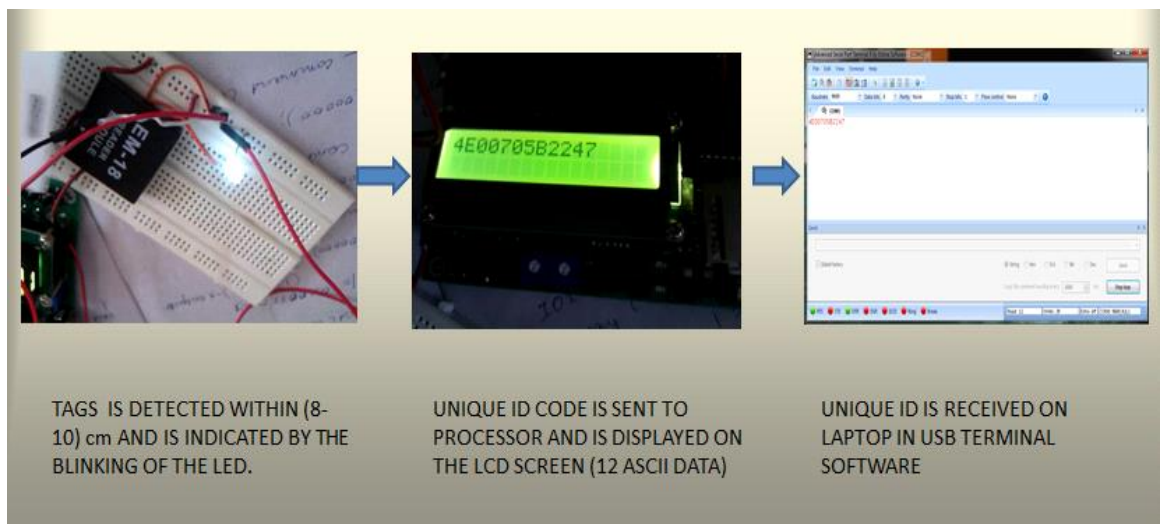


Figure 22: card detect > LCD display > serial Comm. To PC

ID	roll_no	date_&_time	indivisual_name	total_classe	presents	Click to Add
1	4E0070205A44	06-may-15 10:45pm	barid	15	3	
2	4E00705B2247	06-may-15 10:46pm	baran	15	9	

ID	roll_no	date_&_time	indivisual_name	total_classe	presents	Click to Add
1	4E0070205A44	06-may-15 10:45pm	barid	15	3	
2	4E00705B2247	06-may-15 10:46pm	baran	15	10	

Figure 23: Before and after updating the database

Future Scope and Enhancements

After the data is received from em-18 module all the data transfer is through wire. We can use wireless network to transfer data from one room to main data storage room using XBEE. Various tags after receiving the data will wirelessly send it to main server. At the main server the database will be present.

CONCLUSION

The hardware and software part of the RFID based attendance system is completed and is successfully interfaced with the arm processor. Complete hardware was implemented on bread board and test to work as expected.

CHAPTER 5

REFERENCES

- Mehdi Ajana El Khaddar¹, Mohammed Boulmalf³, Hamid Harroudi² and Mohammed Elkoutbi¹” **RFID Middleware Design and Architecture**
- Linda Castro & Samuel Fosso Wamba ,École Polytechnique de Montréal “**AN INSIDE LOOK AT RFID TECHNOLOGY**
- Arulogun O. T., Olatunbosun, A., Fakolujo O. A., and Olaniyi, O. M.”RFID based attendance system.
- Trevor Martin published by hitex(UK) Ltd. ISBN: 0-95499881, first published February 2005 ,**The Insider's Guide To The Philips ARM7-Based Microcontrollers**
- HANS PETTER HALVOSEN, department of electrical engineering ,information technology and cybernetics **introduction to LabVIEW.**
- GARRY W. JOHNSON, RICHARD JENNINGS , PUBLISHED BY McGraw-Hill, **LabVIEW Graphical Programming.**
- Aberdeen Group (2006) RFID Value Lies in Enabling Simple Tasks. Retrieved from http://www.aberdeen.com/summary/report/perspective/PER_RFID_ROI_JF_3262.asp
- Accenture (2005) Pushing the Pace: How Leaders are Putting RFID to Work. Retrieved from http://www.accenture.com/Global/Research_and_Insights/By_Industry/Retail/HowWork.htm
- AIM Publication (2001) Shrouds of Time, the History of RFID. Retrieved from http://www.aimglobal.org/technologies/rfid/resources/shrouds_of_time.pdf.
- Alvin Systems (2005) Radio Frequency Identification (RFID) and Wireless Solutions for Healthcare Service Providers. Retrieved from http://www.alvinsystems.com/resources/pdf/healthcare_rfid.pdf
- Asif, A., Mandviwalla, M. (2005) Integrating the Supply Chain with RFID: a Technical and Business Analysis. Communications of the Association for Information Systems, Vol. 15, 393-427.
- Sun Microsystems (2004) The Sun Global RFID Network Vision: Connecting Businesses at the Edge of the Network.
- Sheffi, Y. (2004) RFID and the Innovation Cycle. International Journal of Logistics Management, Vol. 15, No. 1, 1-10.
- Smith, A. (2005) Exploring Radio Frequency Identification Technology and its Impacts on Business Systems. Information Management and Computer Security, Vol. 13, No. 1, 16-28.
- Smith, H.Y., Konsynski, B. (2003) Developments in Practice X: Radio Frequency Identification (RFID) – an Internet for Physical Objects. Communications of the Association for Information Systems, Vol. 12, 301-311.
- Spekman, R. E., Sweeney II, P. J. (2006). RFID: from Concept to Implementation. International Journal of Physical Distribution & Logistics Management, Vol. 36, No. 10, 736 – 754.